

**II. The claims are novel**

Claims 1-7, 9-13 and 15-19 stand rejected due to alleged anticipation under §102(e) over Kamegawa. Applicant respectfully submits that Kamegawa fails to disclose all of the claimed combinations of features, as required for an anticipation rejection. For at least the reasons herein, Applicant respectfully requests withdrawal of the anticipation rejection, and allowance of the claims.

Kamegawa discloses an iterative process of achieving an objective function, based on design variables, which have converged to an estimated value. A plurality of basic models are determined for the tire, each model having an objective function, design variable, constraint and fitness function. Alternative values are repeatedly searched for in the entire solution space, to cover all available alternative values, until a required performance level is achieved. Thus, a pool of solutions is generated. As a result, the calculations are iteratively performed on the entire solution space. Applicant respectfully submits that genetic algorithms of this kind require tremendous amounts of experimental and computational time, which is believed to be a disadvantage of the Kamegawa approach.

In contrast, the claimed invention uses neural networks that permit 'learning' in order to achieve a required performance level. This claimed scheme permits probabilistic matching so as to recognize and adapt to changing inputs, so that it is not necessary to iteratively operate on the entire solution space, as is done for Kamegawa. The difference in the approaches includes the difference between determining the best possible solution that can be achieved, versus

determining how well adverse conditions can be compensated for while exploiting good conditions.

Because a non-linear relationship between performance of the tire and design parameter changes can occur in the claimed invention, the relationship between input data is learned through non-linear prediction (e.g., a neural network-based conversion system). More specifically, the claimed neural network performs prediction, and predicts to a higher degree of accuracy than a related art linear transformation multi-variable analysis. The claimed conversion system (i.e., a correspondence between the design parameters of the tire and the performances thereof) is determined in advance.

Applicant respectfully submits that Kamegawa fails to disclose a conversion system in which a non-linear correspondence between design parameters of a tire and performances of the tire is established, as recited in independent claims 1, 10, and 15. In items 17-21 of the Office Action, the Examiner appears to be further explaining the 35 U.S.C. §102 rejections. Applicant's response to those arguments is incorporated into the discussion below.

Applicant reminds the Examiner that under MPEP § 2131, in order to anticipate a claim, the reference must teach every element of the claim. Additionally, the prior art must be shown in as complete detail as is contained in the claim. Applicant submits that Kamegawa does not meet these requirements.

The Examiner has asserted that Kamegawa discloses both linear and non-linear objective functions, but acknowledges that Kamegawa does not explicitly disclose non-linear [see item 18 of the Office Action]. To overcome this acknowledged explicit deficiency, the Examiner asserts

that Kamegawa implies a non-linear objective function. For at least the reasons below, Applicant respectfully submits that Kamegawa does not disclose a non-linear objective function, as recited in independent claims 1, 10 and 15, per the requirements of 35 U.S.C. § 102.

Additionally, the Examiner has asserted at item 17 of the Office Action that there is no objective indication that Kamegawa is limited to linear systems, and interprets the 'objective function' of Kamegawa as including both linear and non-linear. However, Applicant submits that the Examiner has not provided supporting evidence (either explicit or implicit) from the prior art of record to substantiate this characterization. Applicant believes that Kamegawa is limited to linear objective function, and has not found any disclosure that the objective function of Kamegawa is also directed to non-linear objective functions.

Without disclosure of the aforementioned claimed features in Kamegawa, it is believed that such a conclusory statement is merely speculative, and does not meet the requirements of 35 U.S.C. § 102.

Examiner also asserts at item 18 of the Office Action that Kamegawa uses a technique that would be useful if and when the objective function was non-linear. As discussed above, Applicant respectfully submits that Kamegawa does not disclose a non-linear objective function. Thus, Applicant respectfully submits that it is not relevant whether the technique of Kamegawa would be hypothetically useful if applied to a non-linear objective function.

Additionally, the Examiner asserts at items 18 and 20 of the Office Action that Kamegawa's use of sensitivities to predict the maximum of the objective function implies that the objective function is non-linear. In response, Applicant respectfully submits that the

Examiner has not explained how the 'sensitivity' is predictive, nor why it necessarily implies that the objective function is non-linear. Applicant also submits that the discussion associated with sensitivity is not relevant to the issue of whether Kamegawa discloses all of the claimed combinations of features.

The Examiner asserts that the 'sensitivity' for each design variable is repeatedly calculated, and would not have been calculated as such if the objective function was linear. However, Applicant respectfully submits that Kamegawa does not disclose the non-linearity of the objective function as the reason for repeating the sensitivity calculations. Instead, Kamegawa repeats calculations to implement a down-selection process from a plurality of basic models until a subset achieves a predetermined number. This iterative process is not disclosed in Kamegawa as being predictive and non-linear.

At item 19 of the Office Action, the Examiner states that simpler predictive functions could be used if Kamegawa was limited to linear functions. However, Applicant respectfully submits that the Examiner has not provided an adequate basis for this hypothetical statement, which appears speculative at best. As discussed above, the Examiner has not adequately established that Kamegawa discloses non-linear objective functions. Further, it is submitted that Kamegawa does not disclose predictive functions, but functions that appear to only be determinative. Also, the Examiner does not explain the relevance of the simpler predictive functions as a motivating alternative disclosed in Kamegawa.

Thus, Applicant respectfully submits that Kamegawa does not disclose a conversion system in which a non-linear correspondence between parameters of a tire and performance of

the tire is established, as recited in independent claims 1, 10, and 15, per the requirements of 35 U.S.C. §102. Thus, Applicant requests withdrawal of this rejection, and allowance of the independent claims.

Applicant respectfully submits that the dependent claims are allowable for at least the same reasons as the independent claims. Additionally, with respect to dependent claims 3, 6, and 18, the claimed invention relies upon predicted and calculated values in obtaining the optimum value of the objective function. This is done by using the conversion system constructed with a multi-layered feed forward type neural network, which permits probabilistic matching. Applicant respectfully submits that Kamegawa does not disclose a probabilistic conversion system or predictive functionality, as recited in claims 3, 6 and 18.

Applicant respectfully submits that Kamegawa fails to disclose the adaptive function recited in claims 7, 13 and 19. In Kamegawa, the use of the term 'mutate' refers to a change in the design variable, and not to the claimed adaptive function. Therefore, Applicant respectfully requests withdrawal of the anticipation rejection of claims 1-7, 9-13 and 15-19.

### **III. The claims would not have been obvious**

Claims 8 and 14 stand rejected due to alleged obviousness under §103(a) over Kamegawa in view of Tang.<sup>1</sup> Applicant respectfully submits that the proposed combination of Kamegawa and Tang is improper because the references cannot be properly combined, and further, even if they were properly combinable, the prior art cited by the Examiner either alone or in

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<sup>1</sup> In items 22 and 23 of the Office Action, the Examiner appears to be stating 35 U.S.C. §103 rejections.

combination, still fails to disclose or suggest the features recited in claims 8 and 14. For at least the reasons herein, Applicant respectfully requests withdrawal of the rejection, and allowance of the claims.

Claims 8 and 14 depend from independent claims 1 and 9, respectively. Applicant respectfully submits that these dependent claims are allowable for at least the same reasons as discussed above with respect to the independent claims from which they depend, as well as the additional reasons discussed in greater detail below.

As discussed above, the prior art fails to disclose a neural network conversion system that has learned to convert the design parameters of the performances thereof, as recited in claims 8 and 14. Also, Applicant respectfully submits that the Examiner's proposed combination of Kamegawa with Tang is improper. Neither of the references provides any motivation to be combined with the other, as proposed by the Examiner. Furthermore, Applicant respectfully submits that the approach presented by Kamegawa teach away from the claimed invention.

For example, but not by way of limitation, the claimed invention implements feed forward neural networks, whereby the system learns through a predictive process so as to convert the design parameters of the performances thereof, as recited in claims 8 and 14. In contrast, Kamegawa imposes a selection process upon a plurality of basic models for subsequently determining, through iterative calculations, an objective function to achieve a predetermined performance. (see Kamegawa: column 6, line 31-4) These schemes are believed to be entirely different and incompatible with one another.

Thus, Applicant respectfully submits that Kamegawa does not teach or suggest this type of conversion system and the Examiner has provided no support for asserting these claims as obvious.

Accordingly, Applicant respectfully submits that there is no motivation to combine the references in the absence of the specification supporting the presently claimed invention. As a result, Applicant respectfully submits that the presently claimed invention is the only possible basis for the Examiner's motivation. Applicant respectfully submits that it would be impermissible hindsight reconstruction to use the specification supporting the claimed invention as a motivation for combining the references.

Applicant respectfully requests withdrawal of the rejections under 35 U.S.C. § 103(a), and allowance of the claims.

#### **IV. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

RESPONSE UNDER 37 C.F.R. § 1.116  
U.S. Application No. 09/269,972

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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